

TEMPORARY PROTECTIVE GROUNDING EQUIPMENT



TEMPORARY PROTECTIVE GROUNDING EQUIPMENT

NOTE:

When ordering assemblies of grounding products, please make sure all items included in the assembly are only from the product line found within this section. Including items from other grounding equipment sections of this book will add additional shipping time.

Grounding Configurator™

The Grounding Configurator™ makes ordering grounding equipment simple and easy. This interactive web tool allows you to easily build the proper temporary grounding equipment for your specific needs. The step by step process takes out the guess work, and makes it easy to change components until the most appropriate ground set is developed.



Just go to our web site and give it a try. You will be prompted from start to finish. All you need to know is the maximum fault current, its duration and the size of cable required on the fault, and the configurator will do the rest. No more second guessing quantities or parts to be sure that you have put together a ground set that will function just as you expect. When you finish, enter your personal information and the configurator will instantly provide you with the bill of materials including part numbers. All that's left to do is to place the order!

Salisbury's Grounding Configurator™ 48-Hour Shipping



Need grounding equipment fast? Salisbury's 48-Hour Shipping Grounding Configurator™ works just as great as our standards Grounding Configurator, but it includes only our quick-ship items. Get the grounding equipment you need as fast as you need it.

Visit **salisburybyhoneywell.com** to use the exclusive Grounding Configurator™ and 48-Hour Grounding Configurator™.

TEMPORARY PROTECTIVE GROUNDING EQUIPMENT

How to specify temporary protective grounding assemblies.

A grounding assembly in its basic form consists of two clamps, one pair of ferrules and a length of cable.

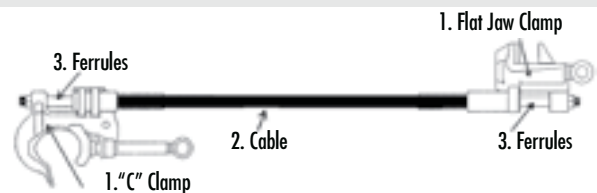
The clamps can be identical to each other or quite different depending on each grounding application. Because of this, ground clamps are sold individually, not in pairs. Salisbury offers a wide variety of clamps including C-clamps, flat jaw clamps, socket clamps, duckbill clamps and specialty clamps for unique situations. Clamps are offered in either bronze or aluminum alloys and are manufactured to meet the current specifications of ASTM F 855.

To attach a clamp to the grounding cable requires the use of a ferrule. Ferrules are compressed on the strands of the cable to provide a low resistance permanent connection. The size of the ferrule is determined by the size of the cable. Ferrules are available in aluminum or plated copper. Plated copper ferrules can be used with either aluminum or bronze clamps. Two ferrules are required for each assembly therefore they are sold in pairs. Ferrules are manufactured to the specifications of ASTM F 855.

The final component that makes up a ground set is the grounding cable itself. The size of the cable is dependent on the short circuit current capacity of the system being grounded. Once this is determined, only the length of the cable and the color of the jacket need to be specified to complete the assembly.



Ground Set Checklist

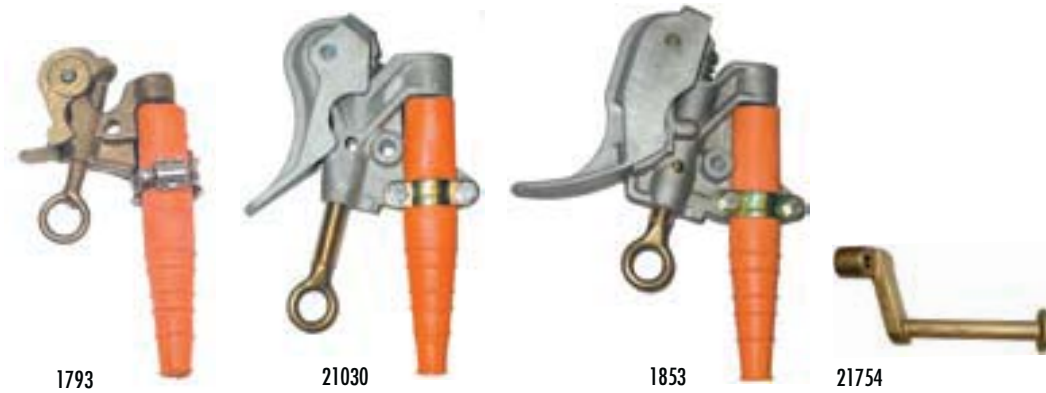


1. Specify the clamps. Two are required for a complete assembly. The maximum amperage of the clamp is designated by the ASTM grade of each clamp. Be sure that the clamp will meet or exceed the maximum amperage rating of the ground cable that it will be used with.
2. Specify the cable. Once the short circuit capacity of the system has been determined, choose the appropriate size cable. Specify the cable length, and the color of the jacket desired.
3. Specify the ferrules. One pair of ferrules is required per assembly. The size of the ferrule must match the size of the cable that it will be used with. Specify whether copper or aluminum, and threaded or plain.
4. Specify the options. List any optional equipment that is desired. This can include hanger studs, contact studs, heat shrink tubing, markings, clear strain relief, etc.

Options also include a ground set label. These optional labels include the date of manufacture and are available upon request when ordering.

DUCK BILL GROUNDING CLAMPS

.96", 1.1", AND 1.65" SIZES



1855 - Stick Mounted Duck Bill Clamp

Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
----------	-------------------------	--------------------	-----------------	---------------------------	-------------------------

556 KCM SMOOTH JAW BRONZE DUCK BILL --Gravity Actuated - "V" Thread

1793	Eye	4 / A Smooth Jaw	556 MCM ACSR to #6	350 RMS Amps 60 Hz	1.3 (.6)
	w/ strain relief sleeve				
	21080 Eye				1.1 (.5)
	w/o strain relief sleeve				
1797*	Mounted	.96" - .16" 24mm - 4mm Dia.			4.3 (2)
	w/ strain relief sleeve				
2093	Hanger Stud only				.4 (.1)

1.1" SMOOTH JAW ALUMINUM DUCK BILL --Spring Loaded - "V" Thread

21030	Eye	5 / A Smooth Jaw	795 KCM ACSR to #6	400 RMS Amps 60 Hz	1.1 (.5)
	w/ strain relief sleeve				
21059	Eye				1.0 (.5)
	w/o strain relief sleeve				
21081*	Mounted	1.1" - .16" 28mm - 4mm Dia.			4.3 (2)
	w/ strain relief sleeve				
21754	Hanger Stud only				.3 (.1)

1.66" SERRATED JAW ALUMINUM DUCK BILL --Spring Loaded - "V" Thread

2553	Eye	5 / B Serrated Jaw	1590 MCM ACSR to #6	400 RMS Amps 60 Hz	1.4 (.6)
	w/o strain relief sleeve				
1855*	Mounted	1.65" - .16" 42mm - 4mm Dia.			4.7 (2.1)
	w/ strain relief sleeve				
21754	Hanger Stud only				.3 (.1)

1.66" SERRATED JAW ALUMINUM DUCK BILL - Acme thread

1853	Eye	5 / B Serrated Jaw	1590 MCM ACSR to #6	400 RMS Amps 60 Hz	1.5 (.7)
	w/ strain relief sleeve				

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

BRONZE

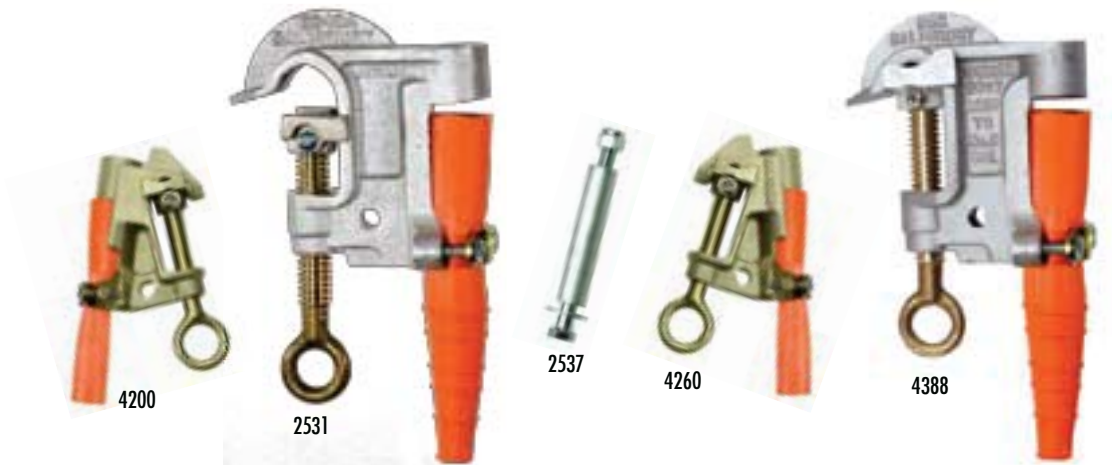
ALUMINUM

ALUMINUM

ALUMINUM

"C" TYPE GROUNDING CLAMPS

.83" AND 1.12" SIZES

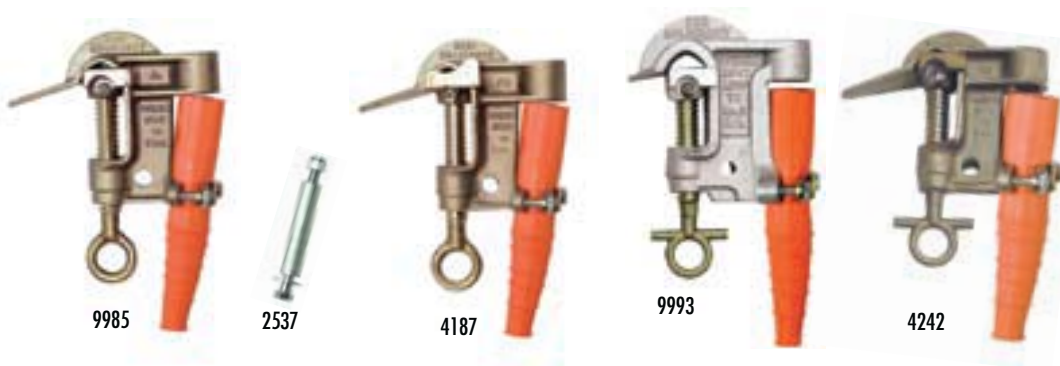


Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)	
477 MCM BRONZE "C" CLAMP w/ Curved Lower Jaw - "V" Thread						
B R O N Z E	4200 Eye w/ strain relief sleeve	5 / A	477 MCM 18 x 1 ACSR to #8	400 RMS Amps 60 Hz	1.1 (.5)	
	21067 Eye w/o strain relief sleeve	Smooth Jaw			1.0 (.4)	
	4260 Eye w/ strain relief sleeve	5 / B	.83" - .12"	400 RMS 60 Hz	1.1 (.5)	
	21068 Eye w/o strain relief sleeve	Serrated Jaw	21mm - 3mm Dia.		1.0 (.4)	
	2093 Hanger Stud only				.4 (.2)	
	1" ALUMINUM "C" CLAMP - Acme thread					
	A L U M I N U M	2531 Eye w/ strain relief sleeve	5 / A	795 MCM 26 x 7 ACSR to #8	400 RMS 60 Hz	1.1 (.5)
2532 Eye w/o strain relief sleeve		Smooth Upper Jaw w/	1.1 (.5)			
2533* Mounted w/ strain relief sleeve		Flat Lower Jaw			4.2 (19)	
4388 Eye w/ strain relief sleeve		5 / B	1.12" - .12" 29mm - 3mm Dia.	400 RMS 60 Hz	1.5 (.7)	
4389 Eye w/o strain relief sleeve		Smooth Upper Jaw w/			1.1 (.5)	
2537 Hanger Stud only		Curved Lower Jaw			.2 (.1)	

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

"C" TYPE GROUNDING CLAMPS

1.12" SIZES

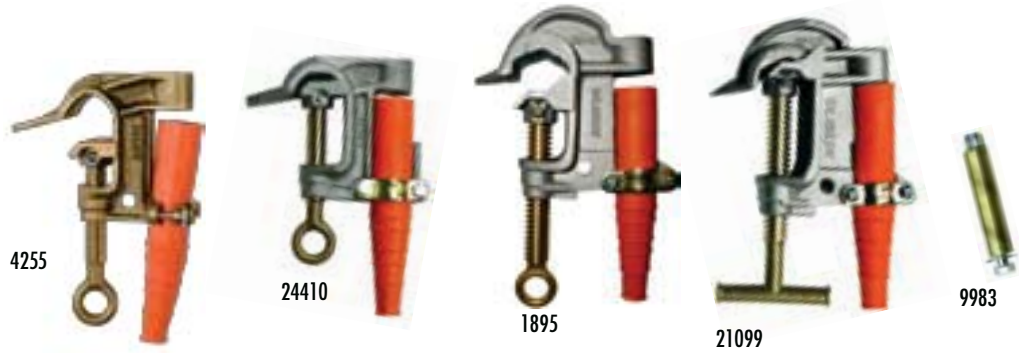


	Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
BRONZE	1" Bronze "C" Clamp - Acme thread					
	9985	Eye w/ strain relief sleeve	5 / A Smooth Jaw	795 MCM 26 x 7 ACSR to #8 1.12" - .12"	400 RMS Amps 60 Hz	1.9 (.9)
	2937	Eye w/o strain relief sleeve				1.8 (.8)
	4280*	Mounted w/ strain relief sleeve				4.9 (2.2)
	4187	Eye w/ strain relief sleeve	5 / B Serrated Jaw	29mm - 3mm Dia.		1.9 (.9)
	2537	Hanger Stud only				.4 (.2)
BRONZE	GRADE 5 "T" / EYE "C" CLAMP - Acme Thread					
	4242	"T" w/ strain sleeve & "T" eye screw	5 / A Smooth Jaw	795 MCM 26" x 7" ACSR to #6 1.12" - .16" 29mm - 4mm Dia.	400 RMS Amps 60 Hz	1.9 (.9)
9993	"T" w/ strain sleeve & "T" eye screw	1.6 (.7)				
ALUMINUM						

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

"C" TYPE GROUNDING CLAMPS

1.26" AND 1.5" SIZES



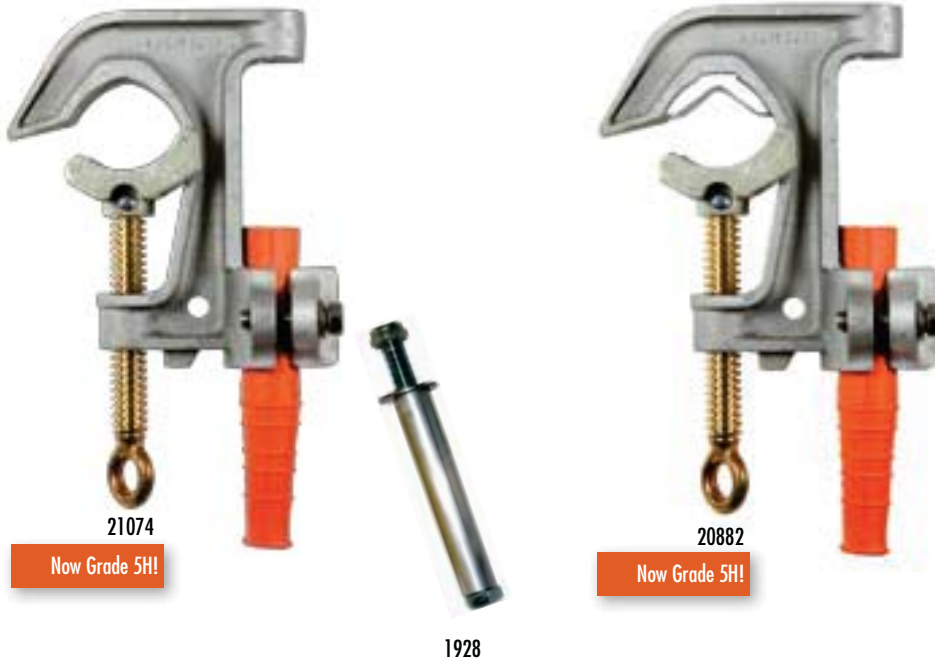
A L U M I N U M B R O N Z E

Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
1.25" BRONZE "C" CLAMP - Acme Thread					
9984	Eye w/ strain relief sleeve	5 / A Smooth Jaw			2.2 (1.0)
1897	Eye w/o strain relief sleeve	w/ Flat Lower Jaw	1035.5 KCM ACSR		2.1 (.9)
4255	Eye w/ strain relief sleeve	5 / A Smooth Jaw	to #6	400 RMS Amps 60Hz	2.2 (1.0)
21069	Eye w/o strain relief sleeve	w/ Curved Lower Jaw	1.26 " - .16"		2.1 (.9)
4279	Eye w/ strain relief sleeve	5 / B Serrated Jaw	32mm - 4mm Dia.		2.2 (1.0)
21070	Eye w/o strain relief sleeve	w/ Flat Lower Jaw			2.1 (.9)
9983	Hanger Stud only				.4 (.2)
1.25" ALUMINUM "C" CLAMP - Acme Thread					
24410	Eye w/ strain relief sleeve	5 / A Smooth Jaw	1035.5 KCM ACSR to #6	400 RMS Amps 60Hz	2.2 (1.0)
		w/ Flat Lower Jaw	1.26 " - .16" 32mm - 4mm Dia.		
1.5" ALUMINUM "C" CLAMP, w/ flat lower jaw - Acme Thread					
1895	Eye w/ strain relief sleeve				1.7 (.8)
2195	Eye w/o strain relief sleeve	5 / B	1431 KCM ACSR to #6	400 RMS Amps 60 Hz	1.5 (.7)
1896*	Mounted w/ strain relief sleeve	Serrated Jaw	1.5" - .16" to #6		
21099	"T" w/ strain relief sleeve		38mm - 4mm Dia.		1.7 (.8)
1928	Hanger Stud only				.2 (.1)

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

"C" TYPE GROUNDING CLAMPS

2" SIZES



Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
2" ALUMINUM "C" CLAMP w/ Curved Lower Jaw - Acme Thread					
21074	Eye w/ strain relief sleeve	5H / A Smooth Jaw	3000 KCM ACSR	400 RMS Amps 60 Hz	2.1 (1.0)
21075	Eye w/o strain relief sleeve	5 / A Smooth Jaw	to #6		2 (.9)
20882	Eye w/ strain relief sleeve	5H / B Serrated Jaw	2"-.16" 51mm - 4 mm	60 Hz	2.1 (1.0)
21077	Eye w/o strain relief sleeve	5 / B Serrated Jaw			2 (.9)
1928	Hanger Stud only				.2 (.1)

Now Grade 5H!

Now Grade 5H!

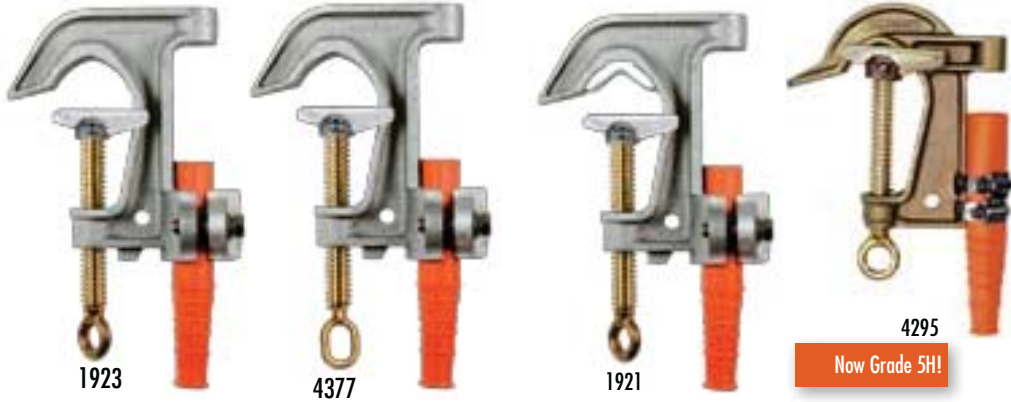
A L U M I N U M

"C" TYPE GROUNDING CLAMPS

2.4" SIZE



1924 - Stick Mounted "C" Type Clamp



Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)	
2.4 " ALUMINUM "C" CLAMP w/ Flat Lower Jaw - Acme Thread						
A L U M I N I U M	1923	Eye w/ strain relief sleeve	5 / A Smooth Jaw	2.0" I.P.S. to #6	400 RMS Amps 60 Hz	2.1 (1.0)
	4377	Eye strain relief sleeve & oval eye				2.1 (1.0)
	4240	Eye w/o strain relief sleeve				2.0 (1.0)
	1924*	Mounted w/ strain relief sleeve				5.1 (2.3)
	1921	Eye w/ strain relief sleeve	5 / B Serrated Jaw	2.4" - .16" 61mm - 4mm Dia.	400 RMS Amps 60 Hz	2.2 (1.0)
	4390	Eye strain relief sleeve & oval eye				2.2 (1.0)
	1922*	Mounted w/ strain relief sleeve				5.2 (2.3)
	1928	Hanger Stud only				
	2.4" BRONZE "C" CLAMP w/ flat lower jaw - Acme Thread					
	B R O N Z E	4295	Eye w/ strain relief sleeve	5H / A	2.0 " I.P.S. to #6	400 RMS Amps
4311		Eye w/o strain relief sleeve	Smooth Jaw	2.4" - .16" 61mm - 4 mm Dia.	60 Hz	4.0 (1.7)

Now Grade 5H!

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

PRESSURE TERMINAL CLAMPS

These **Duckbill** and **“C” Clamps** feature pressure terminations for use with plain ferrules. Made of high strength aluminum, with bronze eye-screws, these Grade 5 clamps are designed for smooth operation and long service life. Duckbill clamps for all grounding applications from .16 to 1.1” diameter. “C” clamps for all grounding applications from .06 to 1.26” diameter.

Flat Jaw Grounding Clamps are now available with pressure terminals for use with plain cable ferrules. These clamps are made of a high strength aluminum, and a bronze eye screw or “T” handle for durability and smooth operation. Also featured is a hardened aluminum alloy serrated insert. This insert is designed to grip tightly to flat surfaces and cut through surface contamination and oxidation for low resistance contact. The pressure termination is designed on an angle keeping the cable out of the way during installation. The cable termination is angled to minimize interface with the “T” handle or eye when installing or removing the clamp.



Salisbury’s **24438 Plain Ferrule 4-way Connector** is available on page H-25.

	Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
M U N I M U L A	1.1" SMOOTH JAW ALUMINUM --Spring Loaded - "V" Thread					
	24404	Duckbill Eye w/o strain relief sleeve	5 / A Smooth Jaw	795 KCM ACSR to #6 1.1" - .16" 28mm - 4mm Dia.	400 RMS Amps 60 Hz	1.5 (.68)
	1.25" SMOOTH JAW ALUMINUM --Spring Loaded - Acme Thread					
	24466	"C" Type Eye w/o strain relief sleeve	5 / B Serrated	1035.5 KCM ACSR to #6 1.26" - .06" 32mm - 1.5mm Dia.	400 RMS Amps 60 Hz	2.2 (1.0)
	24407	Stick mounted duckbill clamp				4.5 (2.05)
	21754	Hanger Stud only				.3 (.1)
	2" SMOOTH JAW ALUMINUM --Spring Loaded - Acme Thread					
	21942	"C" Type Eye w/o strain relief sleeve	5 / B Serrated	1035.5 KCM ACSR to #6 1.26" - .06" 32mm - 1.5mm Dia.	400 RMS Amps 60 Hz	2.2 (1.0)
	ALUMINUM FLAT JAW Grounding Clamp - Acme Thread					
	24405	"T" screw no strain relief sleeve	5 / B	1.5" - .06" Flat or Square	400 RMS Amps	2.1 (.9)
24406	Eye screw no strain relief sleeve	Serrated Jaw	1.26" - .06" 32 - 1.5 mm Dia.	60Hz	2.0 (.9)	

GROUNDING CLAMPS FOR SUBSTATION BUSES



Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
----------	-------------------------	--------------------	-----------------	---------------------------	-----------------------

3.5" ALUMINUM "C" CLAMP for Substation Buses - Acme Thread

M U N I M	4282	Eye w/ strain relief sleeve	5 / A Smooth Jaw	3" - 1.5" I.P.S.	400 RMS Amps	2.8 (1.3)
	4283*	Mounted w/ strain relief sleeve	w/ Flat Lower Jaw	3.5" - 1.75" 89mm - 44mm Dia.		5.8 (2.5)
	21953	Eye w/ strain relief sleeve	5H / A Smooth Jaw w/ Flat Lower		60 Hz	
	4341	Eye, strain relief w/ sleeve & long eye screw (Main line range 3.5"-.16"(89-4mm))	5 / A Smooth Jaw w/ Flat Lower Jaw	3" I.P.S. to #6 3.5" - .16"		2.9 (1.4)
	21985*	Eye, strain relief sleeve & long eye screw	6 / B Serrated Jaw w/ Flat Lower Jaw	89mm - 4 mm Dia.	450 RMS Amps 60 Hz	3.0 (1.5)

21953 Now Grade 5H!

6.62" ADJUSTABLE ALUMINUM " C " CLAMP for Round, Square, Rectangle or "H" Section Substation Buses - Acme Thread

U L A	2991	Eye w/ strain relief sleeve	5H / A Smooth Jaw w/ Flat Lower			6.9 (3.1)
	2993**	Eye w/ welded single contact stud	5 / A Smooth Jaw	6.12" I.P.S.	400 RMS Amps	7.0 (3.2)
	9967**	Eye w/ welded double contact stud	w/ Flat Lower Jaw	6.62" - .4" 168mm - 10mm Dia.	60 Hz	7.3 (3.3)
	4378	Eye, strain relief sleeve & oval eye				6.9 (3.1)

2991 Now Grade 5H!

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

**No Ferrule Connection

*Accepts 3/4 - 10 ferrule threads

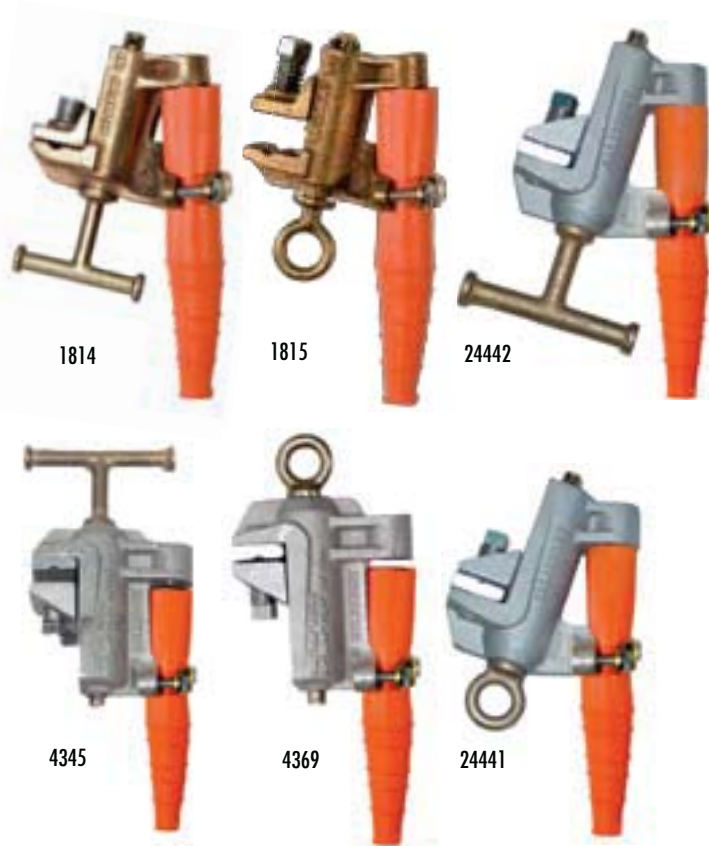
SALISBURY by Honeywell

101 E. Crossroads Pkwy., Ste. A Bolingbrook, IL 60440 toll free ph (USA):877.406.4501 toll free fax (USA):866.824.4922 ph:630.343.3800 H-11

GROUNDING CLAMPS

FOR FLATS, ANGLES & ROUNDS

Flat Jaw Grounding Clamps are available with either a large “T” handle or with an eye for clampstick application. The handles and eyes are designed so that the cable will not interfere with the torquing of the clamp. The set screw that secures the clamp to a flat surface is located on the movable jaw on all designs. When tightened, the set screw forces the fixed jaw of the clamp firmly against the flat ensuring a consistent low resistance current path directly through the body of the clamp to the cable connection. With other designs having a set screw on the fixed jaw, current is required to flow through mechanical connections between the movable jaw, the eye screw, and the body of the clamp before passing to the cable connection.

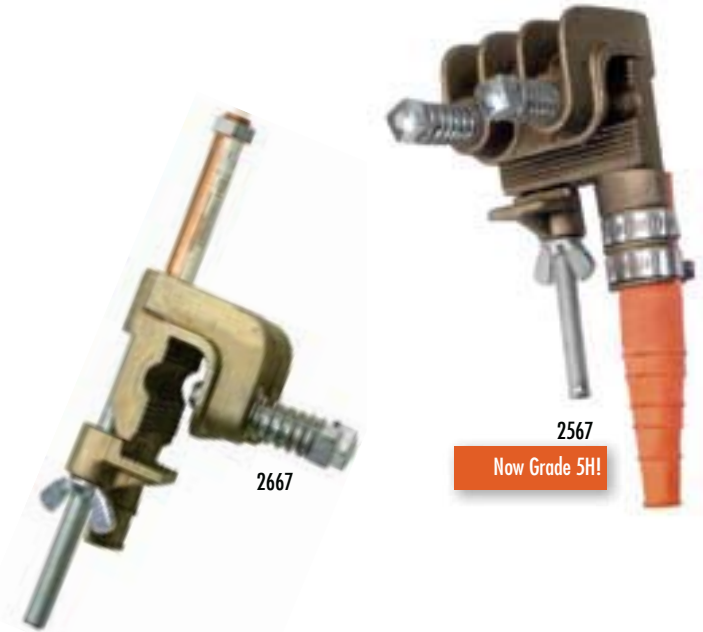


	Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)			
B R O N Z E	GRADE 3 BRONZE FLAT JAW Grounding Clamps - "V" Thread								
	1814	"T" w/ strain sleeve & "T" screw	3 / B	1.5" - .06" Flat or Square	300 RMS Amps	1.7 (.8)			
	1815	Eye w/ strain sleeve & eye screw	Serrated Jaw	1.26" - .06" 32mm - 1.5 mm Dia.	60Hz	1.6 (.7)			
A L U M I N U M	GRADE 5 ALUMINUM FLAT JAW Grounding Clamp - Acme Thread								
	4345	"T" w/ strain sleeve & "T" screw	5 / B	1.5" - .06" Flat or Square	400 RMS Amps	2.1 (.9)			
	24442	"T" w/ strain sleeve & "T" screw				2.1 (.9)			
	4369	Eye w/ strain sleeve & eye screw				Serrated Jaw	1.26" - .06" 32mm - 1.5 mm Dia.	60Hz	2.0 (.9)
	24441	Eye w/ strain sleeve & eye screw							2.0 (.9)

*Mounted: 1.25" dia x 6' Fiberglass Hot Stick permanently mounted

HEAVY DUTY DUAL-PURPOSE CLAMPS

The **Heavy Duty Bronze “C” Type Flat Jaw Clamp** with anti-blow off keeper is made to fit structural angles, flats, and copper or copperweld stranded grounding assemblies. To install, first use an abrasive cloth or wire brush to clean the surface to be clamped. Then, wipe the surface clean, position the clamp, finger tighten and set the screws. Use a wrench to secure and tighten. A 2667 clamp with contact stud offers greater versatility.



2567 Now
Grade 5H!

Cat. No.	Eye & Clamp Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
2567	w/ Strain Relief Sleeve	5H / B	Angles & Flats: 2.5"-4" WX (64-101 x 3-19mm)	5/8-11UNC Max. Cable Size 4/0 Type V	4 (1.8)
	5/8"-11NC Connection	Serrated Jaw	Rounds: .25"-.75" (6-19mm) Dia.	Compression Ferrules	
2577	w/ Strain Relief Sleeve	6 / B	Angles & Flats: 2.5"-4" WX (64-101x3-19mm)	3/4-10UNC Max. Cable Size 250 MCM	4 (1.8)
	3/4"-10NC Connection	Serrated Jaw	Rounds: .25"-.75" (6-19mm) Dia.	Type V Compression Ferrules	
2667	2567 Clamp w/ Contact Stud	5 / B	Angles & Flats: 2.5"-4" WX (64-101 x 3-19mm)	5/8-11UNC Max. Cable Size 4/0 Type V	5 (2.3)
		Serrated Jaw	Rounds: .25"-.75" (6-19mm) Dia.	Compression Ferrules	

SPECIALTY CLAMPS

Cutout Clamps are applied with a clampstick into the bottom hinge contact of a cutout. This clamp can be used as part of a ground assembly or by using a contact stud using a standard grounding assembly with “C” clamps from the stud to ground.

Lightweight, heavy duty **Stringing Ground** installs anywhere along the length of conductor to provide a continuous grounding bond, even if the conductor is slack. Constructed of high-strength aluminum alloy with large diameter sheaves and bronze bushing bearings. Side opening for quick, easy installation. Adjustable compression spring assures proper contact for different sizes of conductor and for easy passage of splices. In tests, this clamp withstood a 25kA, 28 cycle short circuit. The three options for a ground tap connection are: termination for ground cables, contact/hanger stud and connector for ground wire.



Cutout Clamp with Contact Stud



Cutout Clamp Jumper Assembly

Cat. No. & Description	ASTM Grade / Class	Main Line Range	Continuous Current Rating	Weight ea. lbs. (kgs)
BRONZE CUTOUT CLAMPS - "V" Thread				
4310 Eye w/ ferrule connection	Grade 5	5/8 - 11 UNC Max. Cable Size: 470	400 RMS Amps	2.1 (1.1)
4373 Eye w/ contact stud		Type VI		3.3 (1.5)
4379 Contact stud only		Threaded Stud Compression Ferrule	60 Hz	1.2 (.5)
STRINGING GROUND				
2155 Stringing ground	Alloy Rollers Smooth Contacts 5 / A	1033.5 KCM ACSR- to #2 Sol 1.26"-.25" 32mm - 6mm Dia Splice: 1.5" (38mm) Dia	300 RMS Amps 60 HZ	5.3 (2.4)

BRONZE

ALUMINUM

BALL & SOCKET SYSTEM

SOCKET CLAMP & BALL STUD “C” CLAMP

The **Ball and Socket Grounding System** allows for variable angle accessibility. This system is compact and lightweight. There are fixed grounding points on the socket clamp. The 21190 Socket Clamp, made from bronze alloy, has a socket size of 1 inch (25.4mm) and a threaded bore boss of 5/8”-11 UNC. The socket clamp has an integral cable support with strain relief sleeve.

The **Ball Stud “C” Clamp** is an universal clamp that can be used in substations and on overhead lines. This universal clamp can be used as a socket clamp on a 1 inch (25.4mm) Ball Stud and as a 1 ½ inch (38mm) C-Clamp on overhead lines. The eye screw is not extended beyond the body of the clamp, minimizing possible thread damage during handling. Double lead V-thread allows for faster installation, minimizing worker fatigue. External and internal ball studs assembly can be used as a current carrying contact stud.

See page J-3 for ball socket studs and accessories available for both Ball & Socket clamps and Ball Stud “C” Clamps.



Specifications for Ball Stud “C” Clamp

- Aluminum clamp body
- Double lead V-thread eye screw is bronze alloy
- ASTM Type 1, Class A, Grade 5 rating
- Fault current ratings:
 - 43,000 Amps – 15 cycles
 - 30,000 Amps – 30 cycles
- Ferrule attachment: 5/8” x 11 UNC for Grade 5 rating
- Grounding cable: #2 min size to 4/0 max size

Cat. No.	Description	ASTM Grade	Continuous Current Rating	Weight ea. lbs. (kgs)
21190	w/ Strain Relief Sleeve	5	400 Amps	1.2 (.54)
21277	w/o Strain Relief Sleeve	5	400 Amps	1.1 (.5)
22675	1” Ball Stud C-Clamp w/ strain relief	5	400 Amps	2.7 (x)
22704	1” Ball Stud C-Clamp w/o strain relief	5	400 Amps	2.6 (x)

GROUNDING CABLES

Grounding Cables are made with extra flexible strand of soft drawn #30 AWG (.01") copper and are available in three different jackets.

The yellow thermoplastic elastomer jacketed cable is the standard for grounding service. It provides a combination of economy, flexibility, and durability. The service temperature ranges from 200° to -50°F per ASTM F 855, Type I requirements.

The black thermoplastic elastomer jacketed cable has a smaller diameter and thinner jacket material giving it better flexibility than the yellow cable. The service temperature ranges from 200° to -50°F per ASTM F 855, Type I requirements.

The PVC transparent flexible thermoplastic jacketed cable allows easy inspection for strand breakage. The flexibility decreases with low temperatures. The service temperature ranges from 140° to -40°F per ASTM F 855, Type III requirements.

The silicone transparent flexible thermoplastic jacketed cable allows easy inspection for strand breakage. The service temperature ranges from 302° to -40°F per ASTM F 855, Type I requirements.



	Cat No.	Size	Strand Dia. in. (mm)	Jacket in. (mm)	Short Circuit Withstand		Continuous Current AMPS, RMS, 60Hz	Wt. / 1000 ft. lbs. (kgs)
					15 Cycles	30 Cycles		
YELLOW	2136	#2-665W	.35 (8.9)	.5 (12.7)	14500	10000	200	282 (127)
	2137	1/0-1064W	.45 (11.4)	.62 (15.7)	21000	15000	250	488 (221)
	2138	2/0-1330W	.49 (12.4)	.65 (16.5)	27000	20000	300	537 (243)
	2139	4/0-2109W	.62 (1.7)	.83 (21.1)	43000	30000	400	836 (379)
BLACK	2636	#2-665W	.35 (8.9)	.47 (12)	14500	10000	200	263 (119)
	2637	1/0-1064W	.45 (11.4)	.58 (14.7)	21000	15000	250	404 (183)
	2638	2/0-1330W	.49 (12.4)	.63 (16)	27000	20000	300	497 (225)
	2649	3/0-1672W	.55 (14)	.72 (18.3)	36000	25000	350	680 (308)
	2639	4/0-2109W	.62 (1.7)	.78 (19.8)	43000	30000	400	770 (349)
PVC CLEAR	2128	#2-665W	.35 (8.9)	.53 (13.5)	14500	10000	200	289 (131)
	2129	1/0-1064W	.45 (11.4)	.64 (16.3)	21000	15000	250	520 (235)
	2133	2/0-1330W	.49 (12.4)	.7 (17.8)	27000	20000	300	546 (247)
	2288	4/0-2109W	.62 (1.7)	.84 (21.3)	43000	30000	400	841 (381)
CLEAR SILICONE	21930	2/0-1330W	.49 (12.4)	.62 (15.7)	27000	20000	300	487 (221)
	21931	4/0-2109W	.62 (1.7)	.78 (19.8)	43000	30000	400	579 (263)

THREADED GROUNDING FERRULES

Salisbury compression **Threaded Grounding Ferrules** provide low resistant connection to cable strands with a threaded stud that securely screws into a clamp. Nut and lock washers increase contact pressure and secure the assembly. Tin plated copper ferrules can be used on either bronze or aluminum body clamps. All Salisbury threaded grounding ferrules are unshrouded and manufactured with a 5/8-11 UNC threaded stud and meets the requirements of ASTM F855.



	Cat. No. Pair	ASTM Grade	Size	Installing Die Codes T&B	Burndy Die Numbers	Weight ea. lbs. (kgs)
A L U M I N I U M	2026	1	#2	50	-	.2 (.1)
	2027	2	1/0	50	-	.2 (.1)
	2620	3	2/0	60	-	.3 (.1)
	2640	5	4/0	71	-	.3 (.1)
	C O P P E R	2022	1	#2	50	U243
2023		2	1/0	50	U243	.4 (.2)
2024		3	2/0	60	U245	.4 (.2)
4277		4	3/0	66		.6 (.3)
2025		5	4/0	66	U247	.6 (.3)

Add suffix "A" to the catalog number when requesting a custom insulated grounding set.

PLAIN SHROUDED & UNSHROUDED FERRULES

Plain Ferrules are designed for use with all grounding clamps that feature pressure terminal including the 1" duckbill and 1.5" flat jaw clamp.

Copper Ferrules are available in two different styles: unshrouded and shrouded. Shrouded ferrules are compressed on both the conductor and the jacket of the cable to reduce bending stress. Unshrouded ferrules are crimped on the conductor strands only. These ferrules are manufactured of tin plated, 99.5% pure copper.

Aluminum Ferrules are available in two different styles: unshrouded and shrouded. Shrouded ferrules are compressed on both the conductor and the jacket of the cable to reduce bending stress. Unshrouded ferrules are crimped on the conductor strands only.



plain shrouded



plain unshrouded

Cat. No. Pair	Cable Size	Strand Die Codes T&B	Jacket Die Codes T&B	Burndy Die Number	Weight ea. lbs. (kgs)
SHROUDED					
24424	#2	50	71	-	0.3 (.14)
24425	1/0	50	71	-	0.35 (.16)
24426	2/0	60	76	-	0.4 (.18)
24427	4/0	66	106	-	0.45 (.20)
UNSHROUDED					
24420	#2	50	-	-	0.3 (.14)
24421	1/0	50	-	U243	0.3 (.14)
24422	2/0	60	-	U245	0.35 (.16)
24423	4/0	66	-	U247	0.35 (.16)
SHROUDED					
24434	#2	50	71	-	0.1 (.045)
24436	2/0	60	76	-	0.15 (.07)
24437	4/0	71	106	-	0.15 (.07)
UNSHROUDED					
24430	#2	50	-	-	0.12 (.54)
24431	1/0	50	-	-	0.12 (.54)
24432	2/0	60	-	-	0.16 (.073)
24433	4/0	71	-	-	0.16 (.073)

Add suffix "A" to the catalog number when requesting a custom insulated grounding set.

C O P P E R
A L U M I N U M

GROUNDING ACCESSORIES

Strain Relief Sleeves reinforce cables at the termination points when used with the cable support system. This decreases strand damage to cables from age or mishandling which reduces current carrying capacity and service life. SALCOR® Strain Relief Sleeves accept all grounding cables #2 through 4/0. Sleeve assembly consists of two parts: the inner sleeve which is discarded if the cable diameter exceeds .72" and tapered outer sleeve, 6.5" long, which can be cut to match the diameters. Clear strain relief sleeves and heat shrink are available to fit ground clamps.



Cat. No.	Description	Weight ea. lbs. (kgs)
CABLE STRAIN RELIEF SLEEVES		
0786	Tapered Outer SALCOR Sleeve Only	.1 (.04)
1758	Inner SALCOR Sleeve Only	.1 (.04)
1788	Complete SALCOR Strain Relief Assembly	.1 (.04)
2633	Clear Sleeve for 4/0 Grounding Cable	.1 (.04)
2983	Clear Sleeve for #2 to 2/0 Grounding Cable	.1 (.04)
20886	Clear Heat Shrink, 5"(127mm) for All Grounding Cables	.1 (.04)

SINGLE GROUNDING ASSEMBLIES

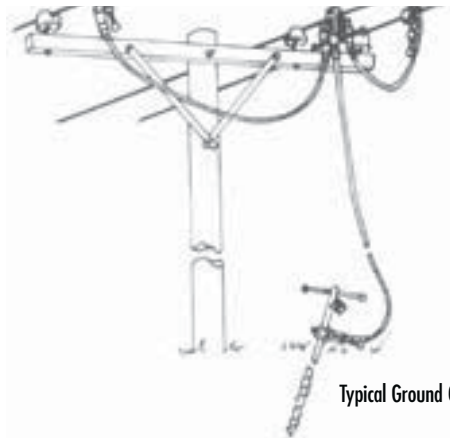
SINGLE GROUNDING ASSEMBLIES & SETS

Salisbury offers a variety of single grounding assemblies. These single ground assemblies offer versatility to the user when performing temporary grounding.

For ordering convenience, completed **Single Grounding Assemblies** are listed which cover many standard application needs. Modification to these sets to meet specific needs can be made. Contact your local Salisbury representative for assistance or visit www.whsalisbury.com/configurator/ to use our helpful online grounding configurator.



24309



Typical Ground Cluster Set

Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
SINGLE GROUNDING ASSEMBLIES			
24309	2 ea. #1895 Serrated Aluminum "C" Clamp 1.5" 1 pr. #2024 Ferrules 6 ft. #2138 2/0 Cu. Cable yellow	3	5.9 (2.7)

Optional ground set label available upon request when ordering.

SINGLE GROUNDING ASSEMBLIES

SINGLE GROUNDING ASSEMBLIES & SETS

Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
SINGLE GROUNDING ASSEMBLIES			
2299	2 ea. #1895 Serrated Aluminum "C" Clamp 1.5" 1 ea. #1928 Hanger Stud, 1 pr. #2027 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	5.9 (2.7)
2319	2 ea. #1923 Smooth Aluminum "C" Clamp 2.4" 1 ea. #1928 Hanger Stud, 1 pr. #2620 Ferrules 10 ft. #2138 2/0 Cu. Cable	3	8.7 (3.9)
2320	1 ea. #1923 Smooth Aluminum "C" Clamp 1 ea. #4345 Aluminum Flat Jaw "T" Handle Clamp 1 pr. #2620 Ferrules, 15 ft. #2138 2/0 Cu. Cable	3	7.4 (3.4)
2321	2 ea. #1793 Bronze Duck Bill 556 KCM 1 ea. #2093 Hanger Stud, 1 pr. #2023 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	5.4 (2.5)
2329	2 ea. #1921 Serrated Aluminum "C" Clamp 2.4" 1 ea. #1928 Hanger Stud, 1 pr. #2620 Ferrules 10 ft. #2138 2/0 Cu. Cable	3	9 (4.1)
2556	2 ea. #1852 Smooth Aluminum Duck Bill Clamp 1.66" 1 ea. #1858 Hanger Stud, 1 pr. #2027 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	5.2 (2.4)
2558	2 ea. #1853 Serrated Aluminum Duck Bill Clamp 1.25" 1 ea. #1858 Hanger Stud, 1 pr. #2027 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	5.5 (2.5)
2876	2 ea. #2531 Smooth Aluminum "C" Clamp 1.0" 1 ea. #2537 Hanger Stud, 1 pr. #2027 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	4.9 (2.2)
9975	2 ea. #9985 Smooth Bronze "C" Clamp 1.0" 1 ea. #9983 Hanger Stud, 1 pr. #2023 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	6.9 (3.1)
9982	2 ea. #9984 Smooth Bronze "C" Clamp 1.25" 1 ea. #9983 Hanger Stud, 1 pr. #2023 Ferrules 6 ft. #2137 1/0 Cu. Cable	2	8.3 (3.7)

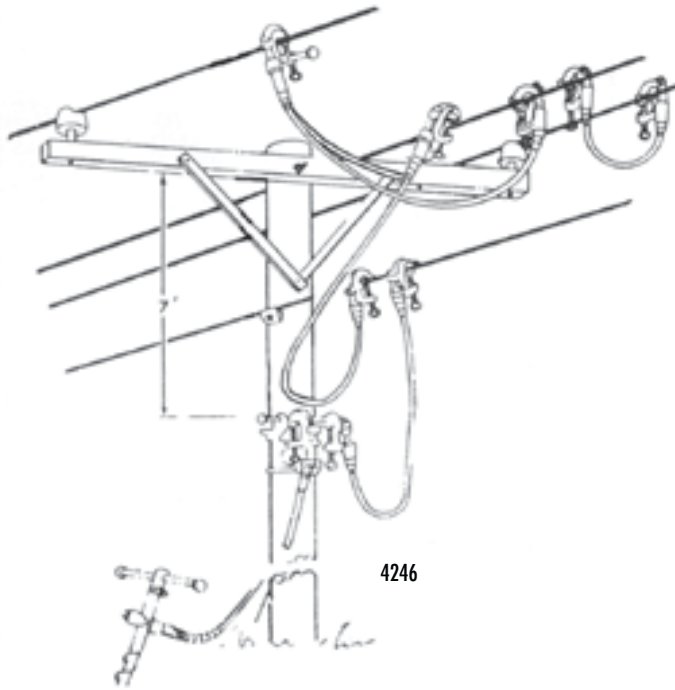
Optional ground set label available upon request when ordering.

GROUNDING SETS

SINGLE POINT DISTRIBUTION GROUNDING SET

This **Single Point Distribution Grounding Set** creates an equal potential zone on the working structure. This is accomplished by bonding all conductors and the structure to a ground source using individual assemblies as shown in the adjacent drawing.

Going from either the ground rod or the system ground to the pole mounted contact bar under the worker's feet, to the assemblies bonding the conductors creates an equal potential zone.



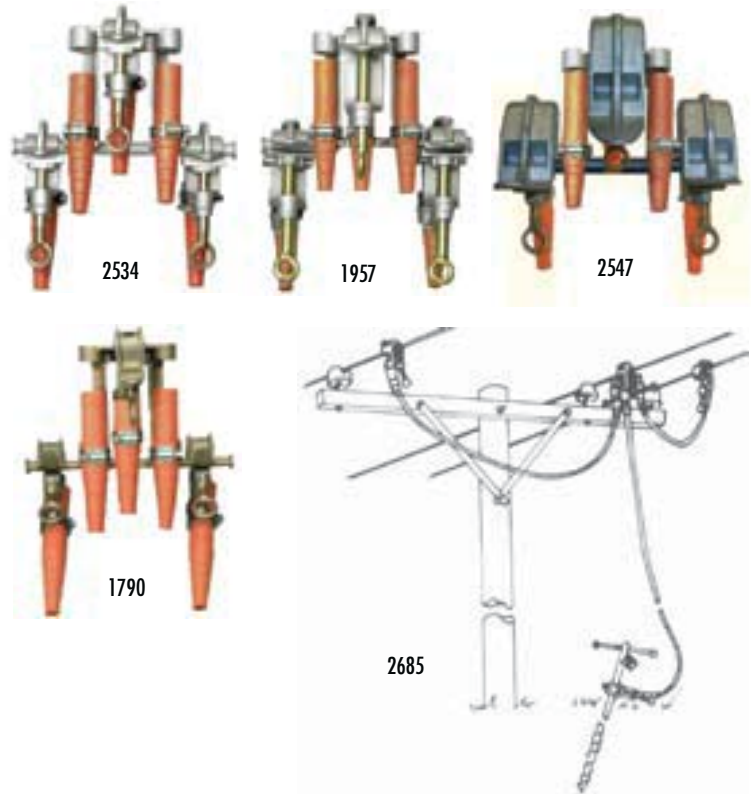
Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
4246	Complete Distribution Grounding Set 10 ea. #2531 Smooth Aluminum "C" Clamps 795 KCM 1 ea. #9998 Aluminum Pole Mount Contact Bar 5 pr. #2026 Ferrules 3 ea. #2537 Hanger studs 60 ft. #2636 # Cu. Cable 1 ea. #2103 Screw Ground Rod w/ Connector	1	45.5 (20.6)

Additional Single Point Sets are available. Contact your local Salisbury representative.
 Optional ground set label available upon request when ordering.

GROUNDING SETS

3 WIRE UNIVERSAL GROUNDING CLUSTERS & SETS

Grounding Clusters are used to make it easy for a single line worker to apply multiple grounding assemblies on a three phase system. All clusters have an option of a ground lead by using the extra connection point on each cluster. Three wire clusters are recommended for three phase Delta systems. Complete grounding cluster assemblies are available from the factory. Specify cable size and length required and assembly will be made to your specifications.



Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
1790	Cluster w/ 3 #1793 Smooth Jaw 556 KCM Bronze Duck Bill Clamps	4	6 (2.7)
1957	Cluster w/ 3 #1895 Serrated Jaw 1.5" Aluminum "C" Clamps	5	6.4 (2.9)
2534	Cluster w/ 3 #2531 Smooth Jaw 1" Aluminum "C" Clamps	5	4.9 (2.2)
2547	Cluster w/ 3 #1853 Serrated Jaw 1.66" Aluminum Duck Bill Clamps	5	5.4 (2.5)
2685	Assembled Ground Cluster Set 1 ea. #2516 Serrated Aluminum "C" Clamp 1.25" Cluster 74 ft. #2637 1/0 Cu. Cable 3 pr. #2027 Ferrules, 1 ea. #2103 Screw Ground Rod 1 ea. #2654 Storage Bag	2	54.2 (24.6)
4248	Assembled Ground Cluster Set 1 ea. #1790 Smooth Bronze Duck Bill Cluster 76 ft. #2636 #2 Cu. Cable 3 pr. #2022 Ferrules, 1 ea. #2103 Screw Ground Rod 1 ea. #2654 Storage Bag	1	54.2 (24.6)

Clusters are also available with Mounted Clamps, consult the factory for more information.
Optional ground set label available upon request when ordering.

GROUNDING SETS

4 WIRE UNIVERSAL GROUNDING CLUSTERS & SETS

Grounding Clusters are used to make it easy to apply multiple grounding assemblies easy for a single line worker. All clusters have an option of a ground lead by using the extra connection point on each cluster. Four wire clusters are recommended for three phase Wye systems. Complete grounding cluster assemblies are available from the factory. Specify cable size and length required and assembly will be made to your specifications.



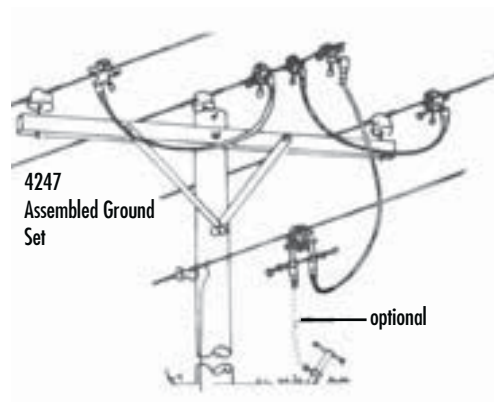
2536



1794



2192



4247
Assembled Ground Set

optional

Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
1794	Cluster w/ 6 #1793 Smooth Jaw 556 KCM Bronze Duck Bill Clamps	4	9 (4.1)
2192	Cluster w/ 6 #1895 Serrated Jaw 1.5" Aluminum "C" Clamps	5	11.8 (5.4)
2536	Cluster w/ 6 #2531 Smooth Jaw 1" Aluminum "C" Clamps	5	8.8 (4)
2604	Cluster w/ 6 #1853 Serrated Jaw 1.66" Aluminum Duck Bill Clamps	5	6.2 (2.8)
2682	Assembled Ground Cluster 1 ea. #1794 Smooth Bronze Duck Bill Cluster 18 ft. #2636 #2 Cu. Cable 3 pr. #2022 Ferrules 1 ea. #2654 Storage Bag	1	14.5 (6.6)
4247	Assembled Ground Cluster 1 ea. #2536 Smooth Aluminum "C" Cluster 18 ft. #2637 1/0 Cu. Cable 3 pr. #2027 Ferrules 1 ea. #2654 Storage Bag	2	18 (8.2)

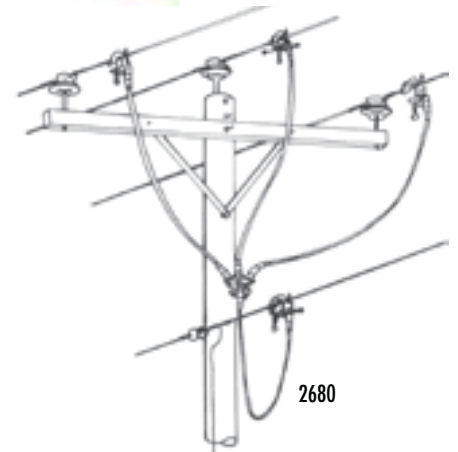
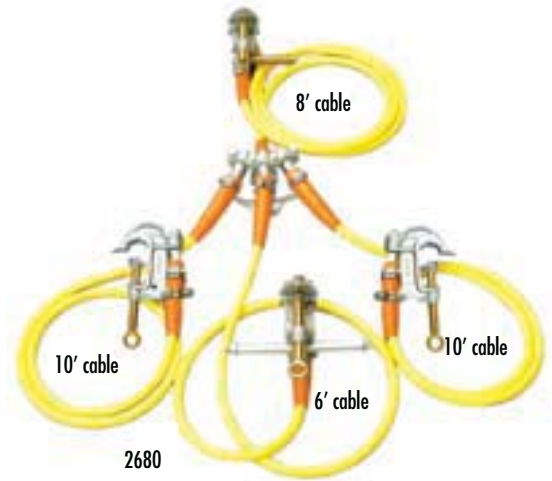
Clusters are also available with Mounted Clamps, consult the factory for more information.
Optional ground set label available upon request when ordering.

GROUNDING SETS

4 WAY CONNECTOR

The **2680 4-way connector** ground set provides an excellent system for the grounding of a 3 phase system.

4-way connectors are used to create a common connection between the conductor leads and the ground lead of a ground set.

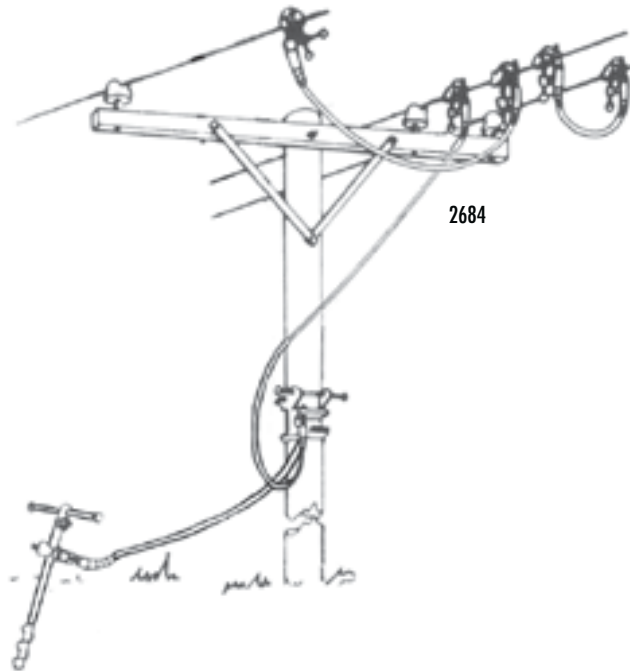


Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
2680	Four Way Connector Ground Set - Grade 2 21 kA 15 cycles 1 #2374 Four Way Connector w/ Sleeves 4 #1895 1.5" Serrated Jaw Clamps w/ Sleeves 1 #2427 Double Hanger Stud, 1 #2402 Contact Stud 34 ft. #2137 1/0 Cu. Cable 4 pr. #2027 Ferrules	2	28 (12.7)
2374	Threaded Ferrule Four Way Connector	5	1.8 (.8)
21702	Threaded Ferrule Four Way Connector 1 3/4 long x 2 1/4 dia.	5	.5 (.23)
24438	Plain Ferrule Four Way Connector	5	2 (.9)

GROUNDING SETS

FOR SPECIAL APPLICATIONS

Listed are some typical complete personal protection ground sets for common line construction. These sets, although practical for many applications, are shown as a guide to help determine individual system needs and for ease of ordering. Variations of these sets may be requested to meet specific situations or user preferences. Your local Salisbury representative can answer any questions you have on personal protection grounding needs and applications.



Cat. No.	Description	ASTM Grade	Weight ea. lbs. (kgs)
COMPLETE 3 PHASE DELTA			
2684	2 ea. #20880 Contact Bar 7 ea. #1895 Serrated Aluminum "C" Clamp 1.5" 84 ft. #2637 1/0 Cu. Black Cable, 4 pr. #2027 Ferrules 2 ea. #1928 Hanger Studs, 1 ea. #2654 Storage Bag 1 ea. #2103 Screw Ground Rod	2	63.5 (28.8)
4249	2 ea. #20880 Contact Bar 7 ea. #2531 Smooth Aluminum "C" Clamp 795 KCM 86 ft. #2637 1/0 Cu. Cable, 4 pr. #2027 Ferrules 2 ea. #2537 Hanger Studs, 1 ea. #2654 Storage Bag 1 ea. #2103 Screw Ground Rod	2	63.5 (28.8)
COMPLETE 4 WIRE WYE			
4276	1 ea. #20880A Contact Bar 7 ea. #2531 Smooth Aluminum "C" Clamp 795 KCM 32 ft. #2637 1/0 Cu. Cable, 4 pr. #2027 Ferrules 3 ea. #2537 Hanger Studs, 1 ea. #2654 Storage Bag	2	34 (15.4)

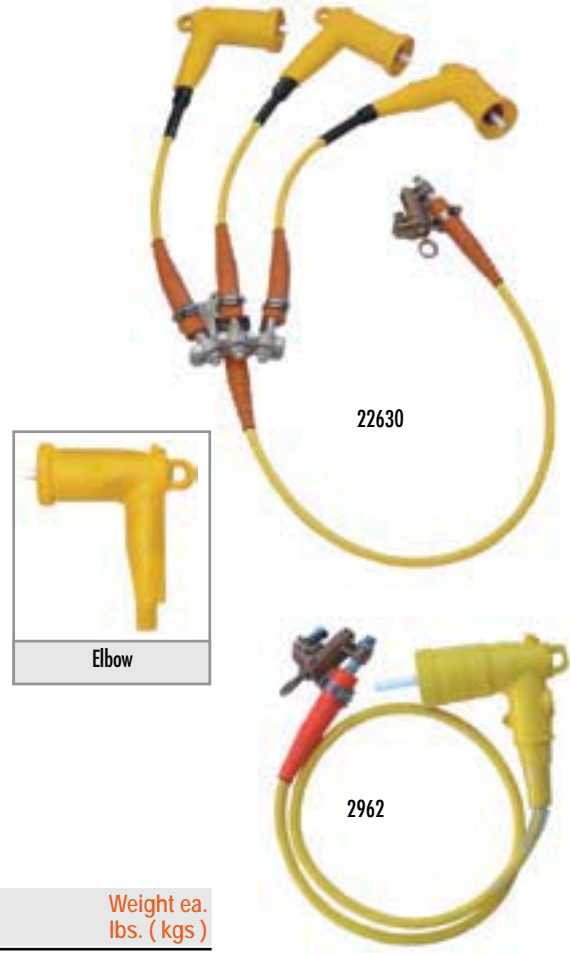
Optional ground set label available upon request when ordering.

GROUNDING SETS

DEAD FRONT GROUNDING JUMPERS & ELBOWS

Dead Front Ground Sets are supplied with an insulated grounding elbow, yellow jacketed copper grounding cable, and a 1815 bronze flat jaw ground clamp for the ground connection. **Grounding Elbows** are equipped with arc quenching tips as provided on standard load break elbows.

Both 15kV and 25kV elbows are available with connectors for 1/0 or 2/0 cable. Assembled sets for 15kV and 25kV are available for single phase or three phase grounding requirements. The fault duty rating for 200 amp grounding elbows is 10kA for 10 cycles per IEEE 386. Standard three phase sets have a 4 ft. tail connecting to a 2374 four wire connector with 2 ft. leads for the elbows. Sets can be factory assembled to customer specifications.



Cat. No.	Description	Weight ea. lbs. (kgs)
INSULATED GROUNDING ELBOWS		
2910	15kV Elbow w/ 1/0 Cable Connector	1.7 (.7)
2912	15kV Elbow w/ 2/0 Cable Connector	1.7 (.7)
2935	25kV Elbow w/ 1/0 Cable Connector	2 (.9)
2936	25kV Elbow w/ 2/0 Cable Connector	2 (.9)
ASSEMBLED GROUNDING SETS		
2961	15kV Single Phase, 6 ft. 1/0 Cable w/ Bag	10 (4.5)
2962	15kV Single Phase, 6 ft. 1/0 Cable w/o Bag	8 (3.6)
2963	15kV Three Phase, 1/0 Cable w/ Bag	22 (10)
22630	15kV Three Phase, 1/0 Cable w/o Bag	20 (9)
2971	25kV Single Phase, 6 ft. 1/0 Cable w/ Bag	13 (5.9)
22631	25kV Single Phase, 6 ft. 1/0 Cable w/o Bag	11 (5)
2973	25kV Three Phase, 1/0 Cable w/ Bag	24 (10.9)
22632	25kV Three Phase, 1/0 Cable w/o Bag	22 (10)

Optional ground set label available upon request when ordering.

ASTM F855-09 Table 1 - Protective Grounding Clamp Ratings

TABLE 1 Protective Ground Cable, Ferrule, Clamp and Assembly Ratings for Symmetrical Current

Grade	Grounding Clamp Torque Strength, min				Short Circuit Properties ^A							Continuous Current Rating, A RMS, 60 Hz
	Yield ^B		Ultimate		Withstand Rating, Symmetrical kA RMS, 60 Hz			Ultimate Rating Capacity ^{C,D} , Symmetrical kA RMS, 60 Hz				
					15 cycles (250 ms)	30 cycles (500 ms)	Copper Cable Size	15 cycles (250 ms)	30 cycles (500 ms)	60 cycles (1 s)	Maximum Copper Test Cable Size	
	lbf-in.	n-m	lbf-in.	n-m								
1	280	32	330	37	14	10	#2	18	13	9	2/0	200
2	280	32	330	37	21	15	1/0	29	21	14	4/0	250
3	280	32	330	37	27	20	2/0	37	26	18	4/0	300
4	330	37	400	45	34	25	3/0	47	33	23	250 kcmil	350
5	330	37	400	45	43	30	4/0	59	42	29	250 kcmil	400
6	330	37	400	45	54	39	250 kcmil or 2 2/0	70	49	35	350 kcmil	450
7	330	37	400	45	74	54	350 kcmil or 2 4/0	98	69	48	550 kcmil	550

^A Withstand and ultimate short circuit properties are based on performance with surges not exceeding 20 % asymmetry factor (see 9.1 and 12.3.4.2).

^B Yield shall mean no permanent deformation such that the clamp cannot be reused throughout its entire range of application.

^C Ultimate rating represents a symmetrical current which the assembly or individual components shall carry for the specified time.

^D Ultimate values are based upon application of Onderdonk's equation to 98 % of nominal circular mil area allowed by Specifications B 172 and B 173.

Reprinted, with permission, from ASTM F 855-09 Standard Specification for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment Table 1, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM, www.astm.org

ASTM F855-09 Table 2 - Grounding Cable Ferrule and Assembly Ratings

TABLE 2 Ultimate Assembly Rating for High X/R Ratio Applications

Grade	Size	High Asymmetrical Test Requirements			
		Rating Rated Current (kA)	X/R = 30 1st Cycle Current Peak (kA) X 2.69	Last Cycle Current Peak (kA)	Test Duration (cycles)
1H	No. 2	15	41	23	15
2H	1/0	25	65	37	15
3H	2/0	31	84	46	15
4H	3/0	39	105	58	15
5H	4/0	47	126	70	15
6H	250 MCM	55	148	82	15
7H	350 MCM	68	183	101	15

NOTE 1—The above current values are based on electromechanical test values.

NOTE 2—Assemblies that have been subjected to these shall not be re-used.

NOTE 3—For use with currents exceeding 20 % asymmetry factor.

NOTE 4—See X4.7.2 for additional information.

NOTE 5—Alternate testing circuits are available for laboratories that cannot achieve the above requirements. See Appendix X4 for details.

Reprinted, with permission, from ASTM F 855-09 Standard Specification for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment Table 2, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM, www.astm.org